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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/693,499	10/27/2003	Masaru Ishikawa	US01-03015	2036

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EXAMINER

BODDIE, WILLIAM

ART UNIT PAPER NUMBER

2629

DATE MAILED: 05/04/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/693,499	ISHIKAWA ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	William Boddie	2629	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 27 October 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>11/3/04, 8/9/04, 10/27/03</u> | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-3 and 16-18 are rejected under 35 U.S.C. 102(b) as being anticipated by Ishikawa (US 6,771,231).

**With respect to claim 1**, Ishikawa discloses, an image display apparatus (fig. 1) comprising:

a display having an image display surface (10a in fig. 1) which displays a two-dimensional image of an object including a three-dimensional object (para. 46); and

an image-transmitting panel (20 in fig. 1) spaced apart from the image display surface for creating an imaging plane (30 in fig. 1) displaying a real image of the two-dimensional image in a space opposite to the display (para. 52);

wherein the image display surface exhibits a three-dimensional image which is drawn from a perspective viewpoint (para. 52; also note the near exact match between the current application fig. 1 with the prior art's fig. 1).

**With respect to claim 2**, Ishikawa discloses, the image display apparatus according to claim 1 (see above), wherein the image transmitting panel includes a micro lens board (24 in fig. 1) having an array of a plurality of micro lenses arranged two-dimensionally, the micro lenses define at least one lens system, each lens system

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having a pair of convex lenses (25 in fig. 1) coaxial with each other, and optical axes of the lens systems are parallel with each other (para. 48).

**With respect to claim 3**, Ishikawa discloses, the image display apparatus according to claim 2 (see above), wherein the image display surface of the display is positioned within a focal depth of the plurality of lenses (note the ray traces in art's fig. 1; which are identical to the ray traces of the Applicant's fig. 1, this inherently implies that the image display surface is positioned within a focal depth of the lenses).

**With respect to claim 16**, Ishikawa discloses, an image display apparatus comprising:

first means for displaying a two-dimensional image of an object including a three-dimensional object, the first means having an image display surface (10 in fig. 1; para. 46); and

second means for creating an imaging plane displaying a real image of the two-dimensional image (20 in fig. 1) in a space opposite to the first means (30 in fig. 1);

wherein the image display surface exhibits a three-dimensional image which is drawn from a perspective viewpoint (para. 52; again notice the striking similarity between the figs. 1 of the two applications).

**With respect to claim 17**, as currently examined claim 17 contains identical limitations to those recited in claim 2. Therefore claim 17 is rejected on the same merits shown above in claim 2.

**With respect to claim 18**, as currently examined claim 18 contains identical limitations to those recited in claim 3. Therefore claim 18 is rejected on the same merits shown above in claim 3.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 4-5, 8, 14, and 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishikawa (US 2001/0022562) in view of Clarke et al. (Clarke, K., Paul D. Teague and H. Greg Smith (1999) "Virtual Depth-based Representation of Cartographic Uncertainty", W. Shi, M. Goodchild and P. Fisher (Eds.) Proceedings of the International Symposium on Spatial Data Quality '99, 18-20th July, Hong Kong, pp. 253-259. )

**With respect to claims 4 and 19**, Ishikawa discloses the image display apparatus according to claims 1 and 16 (see above).

Ishikawa does not expressly disclose drawing an object larger that is close and smaller that is farther away.

Clarke discloses, drawing closer objects larger (p. 255; 6<sup>th</sup> bullet).

Clarke and Ishikawa are analogous art because they are from the same field of endeavor namely attempting to display three-dimensional objects from two-dimensional surfaces.

At the time of the invention it would have been obvious to draw the images on the display of Ishikawa as taught by Clarke.

The motivation for doing so would have been to remove virtual uncertainty effects when viewing the pseudo-three-dimensional image (Clarke; p. 254, 4<sup>th</sup> paragraph).

Therefore it would have been obvious to combine Clarke with Ishikawa for the benefit of creating a more realistic 3-D image to obtain the invention as specified in claims 4 and 19.

**With respect to claims 5 and 20**, Ishikawa discloses the image display apparatus according to claims 1 and 16 (see above).

Ishikawa does not expressly disclose overlaying objects that are closer over objects that farther away.

Clarke discloses, drawing overlapping objects that are farther away with objects that are closer (p. 255; 1<sup>st</sup> bullet).

For motivation and further merits of the combination see the above rejection of claims 4 and 19.

**With respect to claim 8**, Ishikawa discloses the image display apparatus according to claim 1 (see above).

Ishikawa does not expressly disclose having one, two or three vanishing points.

Clarke discloses, generating depth perception by convergence of lines on the horizon (converging lines are equivalent to vanishing points; p. 255; 2<sup>nd</sup> bullet).

For motivation and further merits of the combination see the above rejection of claims 4 and 19.

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**With respect to claim 14**, Ishikawa discloses the image display apparatus according to claim 1 (see above).

Ishikawa does not expressly disclose drawing shadows about the object.

Clarke discloses, providing light to help locate the objects in 3-d space by the characteristics of the feature's cast shadow (p. 255; 3<sup>rd</sup> bullet).

For motivation and further merits of the combination see the above rejection of claims 4 and 19.

5. Claims 10, 13 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishikawa (US 2001/0022562) in view of Drascic et al. (Drascic, D., Paul Milgram (1996) "Perceptual Issues in Augmented Reality", M. Bolas, S. Fisher and J. Merritt (Eds.) SPIE Volume 2653: Stereoscopic Displays and Virtual Reality Systems III, January – February 1996, San Jose, CA, USA, pp. 123-134).

**With respect to claim 10**, Ishikawa discloses the image display apparatus according to claim 1 (see above).

Ishikawa does not expressly disclose drawing an object with more contrast that is closer versus less contrast when the object is farther away.

Drascic discloses, that low contrast often causes objects to appear farther away than they really are (p. 129; Contrast Mismatches heading).

Drascic and Ishikawa are analogous art because they are from the same field of endeavor namely attempting to display three-dimensional objects from two-dimensional surfaces.

At the time of the invention it would have been obvious to draw the images on the display of Ishikawa with varying contrast as taught by Drascic.

The motivation for doing so would have been to create a more realistic 3-D image.

Therefore it would have been obvious to combine Drascic with Ishikawa for the benefit of creating a more realistic 3-D image to obtain the invention as specified in claim 10.

**With respect to claim 13**, Ishikawa discloses the image display apparatus according to claim 1 (see above).

Ishikawa does not expressly disclose drawing objects with more resolution when they are positioned closer, and less resolution when positioned farther away.

Drascic discloses, that objects that are fuzzy and of low resolution appear farther away than sharp, high-resolution objects (p. 129; Limitations of Resolution and Image clarity heading).

For motivation and further merits of the combination see the above rejection of claim 10.

**With respect to claim 15**, Ishikawa discloses the image display apparatus according to claim 1 (see above).

Ishikawa does not expressly disclose drawing objects with relative speed based on their distance from the viewer.

Drascic discloses, that objects that are closer appear to move faster than objects located a distance away (motion perspective; p. 126, Kinetic depth cues heading)



For motivation and further merits of the combination see the above rejection of claim 10.

6. Claims 9 and 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishikawa (US 2001/0022562) in view of Foley et al. (Foley, James D., Andries van Dam, Steven K. Feiner, and John F. Hughes. Computer Graphics: Principles and Practice. 2nd ed. New York: Addison-Wesley Publishing Company, 1990.).

**With respect to claim 9**, Ishikawa discloses the image display apparatus according to claim 1 (see above).

Ishikawa does not expressly disclose drawing objects with relative brightness based on their position from the viewer.

Foley discloses, drawing close objects with more intensity than distant objects (brightness is equivalent to intensity; p. 727, 2<sup>nd</sup> para.). Foley also discloses gradually changing the brightness of the object with respect to distance (p. 727, 2<sup>nd</sup> para. also note fig. 16.7 which shows different spheres with brightness' selected based on the intended perceived distance).

Foley and Ishikawa are analogous art because they are from the same field of endeavor namely attempting to display three-dimensional objects from two-dimensional surfaces.

At the time of the invention it would have been obvious to draw the images on the display of Ishikawa with the color scheme as taught by Foley.

The motivation for doing so would have been to create a more realistic 3-D image.

Therefore it would have been obvious to combine Foley with Ishikawa for the benefit of creating a more realistic 3-D image to obtain the invention as specified in claim 9.

**With respect to claim 11**, Ishikawa discloses the image display apparatus according to claim 1 (see above).

Ishikawa does not expressly disclose drawing objects which are closer more vividly than objects that are farther away.

Foley discloses, drawing close objects with more intensity than distant objects (as best the examiner understands the vividness of a color is directly tied to the intensity of the color; therefore in this instance intensity is seen as equivalent to vivid; p. 727, 2<sup>nd</sup> para.).

For motivation and further merits of the combination see the above rejection of claim 9.

**With respect to claim 12**, Ishikawa discloses the image display apparatus according to claim 1 (see above).

Ishikawa does not expressly disclose drawing an object with warmer colors that is closer versus colder colors when the object is farther away.

Foley discloses, that red objects appear closer and blue colored objects appear more distant (p. 603; 2<sup>nd</sup> para. 2).

For motivation and further merits of the combination see the above rejection of claim 9.

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7. Claims 6-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishikawa (US 2001/0022562) in view of Xia et al. (Xia, Julie C., Jihad El-Sana and Amitabh Varshney (1997) "Adaptive Real-Time Level-of-Detail-Based Rendering for Polygonal Models", IEEE Transactions on Visualization and Computer Graphics, Vol. 3, No. 2, April-June 1997, p. 171-183).

**With respect to claims 6 and 7**, Ishikawa discloses the image display apparatus according to claim 1 (see above).

Ishikawa does not expressly disclose drawing an object rougher that is close and finer that is farther away.

Xia discloses, drawing objects rougher that are closer and finer when the object is positioned farther away, and also continuously changing from rough to fine when a single object is displayed (as currently understood by the Examiner; the level of detail of an object is equivalent to the roughness/fineness of the object; p. 171-172; introduction).

Xia and Ishikawa are analogous art because they are from the same field of endeavor namely attempting to display three-dimensional objects from two-dimensional surfaces.

At the time of the invention it would have been obvious to draw the images on the display of Ishikawa as taught by Xia.

The motivation for doing so would have been to accelerate the graphical rendering of the three-dimensional objects (Xia; p. 171 first column).

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Therefore it would have been obvious to combine Xia with Ishikawa for the benefit of accelerated graphical rendering to obtain the invention as specified in claims 6 and 7.

***Conclusion***

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Will Boddie whose telephone number is (571) 272-0666. The examiner can normally be reached on Monday through Friday, 7:30 - 4:00 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amr Awad can be reached on (571) 272-7764. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Wlb  
4/27/06

AMR A. AWAD  
PRIMARY EXAMINER  
